Sustainable Quality Of Life

"The cost of failure is infinite."

Prioritized Recommendations from the SQoL Working Group

1) **The city's Environmental Planning Commission should have a permanent voting member to represent the environment.**

2) **To reduce the rate of population growth, and to increase the quality of life, the city should fund any unmet need within the city for family planning (i.e. any need not already met by the state and county and other sources).**

3) The city shall tax extraction of resources within its borders. In particular, the city should steeply tax (or prohibit) groundwater pumping beyond the level that is sustainable.
4) As the city plans for the future, the city should aim to keep population and consumption within a level that is sustainable, and the level that is sustainable should be based not on an "average" year, but on a "bad" year, such as a drought year. Similarly, planned population should not exceed the number that the city can reasonably expect to take care of (at a reduced but safe standard of living) after an earthquake or other disaster.
5) Although no small geographic area can be entirely self-sufficient (producing all the iron, copper, food, oil, etc. that it needs), the city can and should aim to meet 100% of its direct energy needs from renewable/sustainable sources.

6) To the extent that the city measures and reports on growth and progress, the measures should be based on quality of life indicators instead of (or in addition to) economic indicators such as the local analogues of GDP (business revenue, per-capita income, etc.). Where economic indicators conflict with quality of life indicators, the quality of life indicators shall take precedence.
7) The city shall offer its employees, and shall encourage business to offer their employees, flexibility in choosing leisure vs. work hours, in order to make it easier for people to choose a balance of income and leisure time that maximizes their quality of life.
8) To the extent practical for a city government, the city shall phase out policies that subsidize and encourage population growth.
9) To the extent practical for a city government, the city shall work to internalize "external costs".

Introduction

Our world, our nation, and our city are running a deep ecological deficit. We consume more than we produce, and we consume far more than we sustainably produce.[1]

We know that we cannot continue doing what we do now -- we cannot continue pumping groundwater faster than it is recharged, cutting forests faster than they re-grow, and mining non-renewable resources such as oil and metal.

But even though we know that we cannot continue doing what we are doing, our politicians, economists, business leaders, and consumers feel no urgent need to change.

Why do we feel little need to change? We have boundless faith in technology, and we believe that technological improvements will allow us to grow population and per-capita consumption forever.

However, the truth is that technology will save us only if we use it to close the gap between what we consume and what we produce sustainably (which is far less than we currently consume). For example, if we use increases in engine efficiency to travel the same number of miles on less fuel, then we are reducing the gap between what we produce sustainably and what we consume. If, however, we use increases in engine efficiency to travel power a bigger car, then we are not reducing the gap. In essence, technology will save us only if we use it to consume LESS, not more.

Historically, when we have improved technology, we have almost always used it to consume more. For example, automobile manufacturers increased engine efficiency 30% over the last 20 years, but 29/30 of that went into increasing power, and only 1/30 into increasing miles per gallon.[2] Similarly, aircraft are increasing fuel efficiency about 1% per year, but passenger-miles traveled increase 5% per year.[3] New computer processors use less energy per calculation, but higher speeds and increased memory mean that we use more electricity than ever. Decades ago, futurists predicted that the ability to see almost anything on a computer screen would bring about "the paperless office". Instead, cheap computer printing made it easy for us to print, and as a result the U.S. uses more paper per office employee than ever before.

These are not isolated examples. If technology were going to save us by closing the gap between what we produce sustainably and what we consume, then that gap should be shrinking each year. In

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[1] New Scientist Magazine, October 6, 2007, p. 10.

[2] I couldn't find the original quote saying 29/30 of the improvement had gone into increase horsepower, not MPG. However, Ray and Tom Magliozzi say that almost all of the fuel efficiency increase in the last 20 years has gone into increasing horsepower. http://www.pbs.org/wgbh/nova/transcripts/3507_car.html

Similarly, John Dillin, in the May 29, 2008 issue of the Christian Science Monitor (p.9) says that average automobile and light truck horsepower has increased from 118 horsepower to 233 horsepower since 1987. During the same time, average MPG has fallen.

[3] "New aircraft, such as Boeing's 787 Dreamliner, due out in the summer of 2008, will be made of lighter composite materials and employ other fuel-saving measures. But these improvements won't be nearly enough to offset the predicted increase in air travel (including air freight)." Christian Science Monitor, February 12, 2007, p.14

"Efficiency is only set to improve at 1 or 2 percent per year at best, while the number of passenger kilometers is growing at 5 or 6 percent." Peter Lockley, quoted in Christian Science Monitor August 17, 2007 p. 5

fact, however, we are less and less sustainable each year, and this is true in both the high-tech countries (such as the U.S.) and the low-tech countries.[4]

If we do not change our behavior, no amount of technological improvement will save us from ourselves. If, on the other hand, we do change our behavior, we do not need any new technology at all; we have enough technology already to, at the very least, sustain our civilization by a factor of 10-30 or more times longer than we can currently sustain it. (Further improvements in technology, if chosen and applied carefully, might allow us to stretch out civilization much longer.) Thus technology is neither necessary, nor sufficient, for us to become much closer to sustainable. The one factor that IS required is a change in behavior.

We are often told that we must choose between a healthy economy and a healthy environment. In fact, however, this is nonsense. A health economy is totally dependent upon a reasonably healthy environment. Our economy depends upon "ecosystem services" for which we are unable to substitute, no matter how much money we spend. For example, several years ago, scientists built a multi-acre biosphere separated from the rest of planet earth -- in essence a giant bubble that was supposed to be self-contained with food-producing areas, water purification areas, etc.[5] Built at a cost of $200 million, the system could not keep 8 people alive for 2 years. The scientists had to "cheat" by adding oxygen, and the people inside the bubble lost weight because they could not produce enough food. As another example, despite decades of research, we do not have a system capable of surviving independently in space -- astronauts need frequent re-supply trips (at a cost of $10,000 per pound of payload) to bring in supplies and "take out the garbage".

Put bluntly, the environment is not an optional luxury sector in the economy -- the economy is an optional luxury sector in the environment.

Three main factors control whether we reduce or expand the gap between what we produce sustainably and what we consume:

1) population
2) per-capita consumption
3) the type of technology that we use.

For a system to be sustainable, ALL of these factors must be sustainable. This is not a case where "majority rules". If 2 factors are sustainable and the 3rd is not, then the system is unsustainable.

Furthermore, for the system to be sustainable, neither population nor per-capita consumption can grow indefinitely.[6] (You might think that they can grow as long as technology allows us to increase efficiency. However, although there is plenty of room for technology to improve the efficiency with which we do things such as grow food, transport goods, etc., we will by definition never be able to exceed 100% efficiency, so there is an upper limit to what the technological factor can do even in an ideal situation. And we are not in an ideal situation! We are already beyond sustainability and thus any technological improvements need to be used to close the gap, not to increase consumption or population.)

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[4] New Scientist Magazine, October 6, 2007, p. 10. The article also says: "By looking at each country's historical trajectory, a clear pattern emerges... [the ecological impact] is growing at a rate proportional to their wealth. Developed countries in particular have done very little to reduce their impact."

[5] http://en.wikipedia.org/wiki/Biosphere_2

[6] The laws of thermodynamics limit growth within a system – even a system as large as the universe.

To make our system sustainable, we must halt population growth and growth of per-capita consumption as quickly as practical. (In the unlikely event that we halt these soon enough, and that technological improves efficiency fast enough, we might theoretically be able to resume some growth in these for a limited period of time in the future, but currently we are deep in “ecological deficit” and we cannot safely grow population or consumption at all until we dig ourselves out of our deficit and build up a large “safety margin”.)

Ironically, although the level of change required is enormous, the changes will be much less difficult than we are often told. For example, anti-environmentalists often warn that if even the most trivial of environmental laws are passed, we will all be "shivering in the dark". In fact, however, our economy and our personal consumption are so inefficient that there is a lot of "low-hanging fruit", and we can drastically reduce our environmental impact by making only trivial changes. (These changes will not be sufficient for us to become fully sustainable, but if done immediately they will buy us quite a bit of time in which to prepare ourselves both psychologically and economically for larger changes.)

Amory Lovins and the team at the Rocky Mountain Institute have estimated that Americans could reduce their energy consumption by 90% with almost no change in standard of living.[7] For example, Lovins says that we could cut consumption of electricity for lighting by 92%.[8] Such improvements are not just theory. 7000 feet above sea level, the Rocky Mountain Institute building in Colorado uses "passive solar" technology to capture the sun's energy and is well insulated, which means it needs only 1% as much heat as a normal building, even in winter.

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[7] http://www.loe.org/shows/segments.htm?programID=08-P13-00013&segmentID=4

[8] "A comprehensive study by Rocky Mountain Institute suggests that if the thousand or so best electricity-saving innovations now on the market were fully installed in U.S. buildings and equipment, they’d save about three fourths of all electricity now used, at an average payback of slightly more than one year, while providing unchanged or improved services."
http://www.rmi.org/images/other/Energy/E90-20_NegawattRevolution.pdf
Amory Lovins says that we could reduce electricity for lighting by 92%: http://www.ccnr.org/amory.html.
Note: These quotes from Lovins are from approximately 1989-1990, so some of the potential energy efficiency improvements may already have been made. Nonetheless, we still have plenty of opportunities for conservation that not only requires no sacrifice, but are outright profitable.

Title: A Presence on the Environmental Planning Commission (EPC)

Working Group: Sustainable Quality of Life (SQoL)

Statement of Issue

In the course of city planning and in the entertaining of proposals before the EPC, it is possible to lose sight of the need for the community to be environmentally sustainable. If there is some presence on the commission itself which has the task to test each proposal against this need and requirement and to report on it and make recommendations, then sustainability concerns can be made visible, considered, and adhered to.

Having a sustainability representative on the EPC also helps satisfy the need to follow up on the recommendations of the Environmental Sustainability Task Force.

Recommendation

Having a "sustainability representative" on the EPC can be done by either:

1) Having as a requirement that at least one member of the EPC be competent in sustainability issues; or
2) Having a non voting sustainability expert on the EPC.

And have sufficient staff support to provide professional, competent assistance or assistance referral to persons in 1) or 2) above.

Adding a non-voting person to the EPC could probably be done immediately. If EPC members have fixed terms, and if there are no current openings, then the council might not place a voting member on the EPC until an existing term is completed or an existing member leaves before his term is up.

Environmental Impact

There is no direct environmental impact to putting a sustainability expert on the EPC. The indirect impact could be large, depending of course upon the decisions that the EPC makes after adding the sustainability expert.

Fiscal Impact and Synergies

There are small additional costs in time and money to do the equivalent of adding another member to the EPC.

There is an additional cost in having a staff member or two dedicated to sustainability issues who will support this member as well as other adapted sustainability policies.

Both the costs and the benefits of having a sustainability expert on the EPC could be considerable as the objectives and concerns that have been made by the Task Force would be made ever present and would have to be addressed, and both the costs and benefits of specific decisions could be large. Depending upon the decisions the EPC makes, the cost of appointing a sustainability expert onto the EPC could be recovered. (Appendix "Sustainability Expert on EPC" gives examples of some potential cost savings that could come from including a sustainability expert on the EPC.)

Since having a sustainability expert on the EPC would tend to support many (probably most) of the recommendations that the ESTF has made, putting a sustainability expert on the EPC has a large positive synergy with most or all of the ESTF working groups' recommendations.

(NOTE: Measuring in dollars, as opposed to measuring in resources (such as carbon, air, and water) can be a false measure because such a measure may not be consistent with natural law.)

Obstacles

- Selecting an expert may be difficult.
  - Some interest groups may not want an "environmentalist" on the planning commission at all.
  - Because sustainability is a very broad topic, it may be difficult to find a person who is well-qualified on a wide range of sustainability issues and has the other qualifications appropriate for a member of the planning commission.
  - If there are no "ideal" candidates, there may be many partly-qualified candidates, and it may be difficult to choose among them.
- There may be debate over whether it is best to add a non-voting member or to replace an existing voting member whose term has expired.

Title: Family Planning.

Working Group: Sustainable Quality of Life.

Statement of Issue:

There is an unmet need for family planning services in Mountain View, particularly among young females and males who are still in school[9]. In the state of California as a whole, more than 60% of all pregnancies are unintended[10].

Unintended pregnancies increase strain on the environment, on families, and on government budgets.

1. Population growth is a major contributor to existing environmental problems. Furthermore, for a system to be sustainable, its population cannot grow indefinitely. The population will only be sustainable if each family has no more than 2 children. [11]

2. Mothers (especially young mothers) and the children born as a result of unintended pregnancy often experience reduced opportunities in life because of inadequate prenatal care in high-risk pregnancies[12], and lack of resources for raising the children.

3. In the long run governments pay higher medical costs when high-risk pregnancies do not get adequate pre-natal care. Furthermore, as population grows, infrastructure costs for government (and the private sector) may rise faster than population. If sprawl occurs, costs for roads and sewers tend to grow faster than tax revenue. If population increases density rather than sprawl, the price of land rises rapidly, and the cost of buying land for schools, parks, etc. goes up faster than the increase in tax revenue generated by the larger population.

After declining in the 1960s and 1970s, the birth rate has increased since then. U.S. population (which never did level off, much less decline) continues to increase.

> "The US is experiencing a baby boomlet… A decline in contraceptive use and poor education are among reasons experts cite."[13]

Recommendation

Mountain View should support outreach work by organizations such as Planned Parenthood and Family PACT[14]. Persons who are of low income or uninsured or who seek confidentiality may be

[9] Article in Mountain View Voice, May 23, 2008 by Casey Weiss, titled 'Eighteen, pregnant and graduating'. There are currently 17 young girls aged 15 to 18 in the MV/LA Young Parents Program. There may be other pregnant young women who have dropped out of school altogether, particularly in years when a Young Parents Program is unfunded.
[10] http://www.marchofdimes.com/files/exec.sum.pdf
[11] Each person must reproduce him/herself only once. Note that if a person has children from more than one marriage (or outside marriage), the total of all those children cannot be more than the total number of parents involved. Remarrying does not increase the number of children that a person can have.
[12] Prenatal care for teens is more likely to be inadequate than for older mothers and pre-term and very pre-term births (and low and very low birth weight births) are more prevalent in teen pregnancies. Santa Clara County Public Health. Department Report on Teen Births (1995-2003), at www.sccphd.org/statistics2
[13] Christian Science Monitor, January 17, 2008. p. 3. http://www.csmonitor.com/2008/0117/p03s04-nbgn.htm

unaware of services available to them. Planned Parenthood is one of the few agencies assisting undocumented persons. Possible outreach work includes:

- Providing public locations to place posters/pamphlets advertising family planning services
- Supporting more comprehensive sex education in high schools and middle schools.
- Facilitating tabling by Planned Parenthood at public events. Planned Parenthood would send two people to staff a table at such events, a clinic staff-person, and an educational program staff-person[15].

The time-line is short (< 1 year) but on-going

Environmental Impact

1) Natural population increase will be lessened, a necessary factor in the eventual attainment of sustainability. In Mountain View, at least 20 fewer children would be born each year, or 100 over 5 years. (If the teen birth rate in MV were the same as that of Santa Clara County as a whole there would be approximately 40 such births per year, but Mountain View's rate is estimated to be lower.) By the fifth year the total GHG's averted per year should be approximately 1000 metric tons of CO2 (assuming 10 metric tons CO2 per person per year). The reductions in CO2 emissions continue to accumulate indefinitely.
2) Quality of life of young women will be improved as they can complete their education and become productive members of society, before choosing whether or not to have a child.

Fiscal Impact

The city of Mountain View should provide financial support if necessary to close the gap between what other levels of government (county, state, and federal) already provide and the amount actually needed for education, services and outreach activities. Placing family planning information and facilitating tabling are relatively low cost activities. The eventual long-term savings and other benefits should be substantial because of improved opportunities for young women, and lessened population increase, with resulting reduced use of all resources and reduced GHG production. The Guttmacher Institute has calculated (for '97-'98) that every dollar spent through Family PACT saved an estimated $4.48 in medical, social service and education costs[16]. Thus from society's standpoint, rather than just the narrow Mountain View fiscal viewpoint, there is a financial benefit from the proposed programs, rather than a cost. Within Mountain View there would be additional savings because of the reduced number of children attending school and participating in other city funded activities.

An estimate of the maximum cost incurred by Mountain View per year for filling gaps in family planning coverage is $100,000. Thus the cost per tonne of CO2 avoided of this program would be $100,000 for 200 tonnes of CO2 emissions averted in the first year, rising steadily to $100,000 for 1000 tonnes in the fifth year. In twenty years, the annual reduction in CO2 emissions would be of the order of 4000 tonnes per year.

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[14] Family PACT, where PACT stands for Planning, Access, Care and Treatment, is a family planning reproductive health care program for uninsured California women and men. It is supported by the Office of Family Planning of California Department of Health Services. A list of Family PACT sites within 5 miles of Mountain View is included as an Appendix
[15] Discussion with Valerie Rowe of Planned Parenthood Mar Monte on April 1, 2008
[16] http://www.guttmacher.org/pubs/tgr/03/5/gr030501.html

Obstacles

- Possible opposition from individuals or groups opposed to family planning in general.

Partnerships

Possible partners include:

- Family PACT,
- Santa Clara County Dept of Public Health,
- Planned Parenthood,
- Mountain View/Los Altos Adult School,
- Mountain View-Whisman Elementary Schools.

See also the appendix titled “Family PACT Sites in or near Mountain View”

Recommendation #3

Title: Tax extraction of non-renewable resources, and extraction of renewable resources at unsustainable rates.

Working Group: Sustainable Quality of Life.

Statement of Issue

Economist Herman Daly pointed out that our tax policies are backwards: we tax (and thus discourage) things we want more of, like savings, and we subsidize (and thus encourage) things that we want less of, like pollution.

Since extraction of non-renewable resources (or extraction of renewable resources at unsustainable rates) is obviously unsustainable, and since futures markets do not adequately take this into account, we should use taxes to discourage extraction of non-renewable resources, or extraction of renewable resources at rates that are unsustainable.

Under free-market theory, using pricing mechanisms (such as taxes) is generally preferable to command-and-control mechanisms. Under the right circumstances, pricing mechanisms tend to encourage efficient usage of the resource.

Recommendation

In Mountain View, we do not extract a lot of non-renewable resources such as metals and oil, but we do extract groundwater, which is a resource that is renewable only up to a point. We therefore recommend that Mountain View implement a tiered tax on groundwater extraction. (If there are other resources in Mountain View that are extracted at unsustainable rates, the city should also tax extraction of those resources.)

The tax would have a low rate for water extraction that is fully sustainable, and a very high rate for water that is pulled out faster than it is naturally replenished. To help ensure that users see the marginal cost of water, rather than the average price, the tax would be combined with tiered rates for water users. For example, if we can sustainably supply 100 gallons of water per day to each household, then the first 100 gallons per household per day would be taxed at a low rate, and consumption beyond that would be charged for at a radically higher rate.

Note that this rate should vary based on the actual rate of replenishment. In a drought year, rates would almost certainly go up.

If extraction leads to other problems, such as compaction of the soil that reduces future groundwater storage capacity, or allows saltwater intrusion, or speeds up the spread of plumes of contaminated groundwater, then such extraction would be taxed at an even higher rate (and might be prohibited altogether except in grave emergencies).

We should also pressure state and federal governments to implement a resource extraction tax on other resources that are non-renewable or that have limited renewability.

The revenue from such a tax could be used to reduce taxes on things that we want more of. For example, we might reduce the following taxes:

1) Sales tax on recycled materials and second-hand goods.

If such a tax were eventually implemented at a state or federal level, the revenue from the tax could be used to reduce taxes on things that we want to encourage, such as savings.

This recommendation can be implemented in the short term and continued into the long term.

Environmental Impact

1. By making water more expensive when it is overpumped, this would discourage unsustainable levels of groundwater extraction and encourage conservation and "graywater" recycling.
2. By reducing water pumping, this would also reduce energy consumption and thus CO2 emissions.

The size of these effects is unknown because they depend heavily upon how much groundwater we currently pump and how we price that water. Because only about 1% of the water consumed in Mountain View is from Mountain View's own groundwater[17], the effect on water price and thus conservation is likely to be fairly small. However, by using tiered pricing to price water "at the margin", the effect could be increased.

Fiscal Impact

This tax would reduce costs (e.g. costs of pumping). The size of the effect is unknown at this time, but probably small.

If the tax has to be implemented from scratch, there is an unknown administrative cost to doing that. If the tax is merely a change in existing tax rates, it would probably have very little administrative cost.

The cost-benefit ratio depends upon whether the tax revenue is kept or is offset by reducing another tax.

Obstacles

- Any increase in taxes or prices will be opposed by some people who will pay the higher price.
- If only Mountain View groundwater extraction is taxed, it's possible that we would increase water extracted from other areas where the tax does not exist, so to some extent the problem might be moved rather than solved.
- We would need to genuinely know the maximum sustainable amount of groundwater that we could pump. This might not be knowable until we have actually damaged the aquifer, and it would vary from year to year depending upon the amount of rainwater seeping into groundwater reservoirs.
- Since Mountain View gets water from multiple sources, and the price and availability of water from each of those sources is likely to vary from year to year, water rates would vary from year to

[17] City of Mountain View Water Quality '07 Consumer Confidence Report.

year. While this is absolutely correct from a free-market perspective, it makes it difficult for water users to plan for the future. Users may be reluctant to invest in water conservation if they don't know whether water prices will go up or down in the future.

- If there are any private wells that the city doesn't know about or that don't have meters, it would take extra work and expense to monitor those if we know about them, and of course we might not even know about them.

Partnerships

Santa Clara Valley Water District
San Francisco Water District / Hetch Hetchy

Recommendation #4

Title: Disaster Planning and Safety Margins

Working Group: Sustainable Quality of Life

Statement of Issue

> "[Disasters are the] new 'normal'… In today's densely populated and technologically dependent communities, disasters have a far greater impact than ever before."[18]
> – Russel Honoré, former commanding general First Army, leader of Joint Task Force Katrina.

For a system to be sustainable, it must be able to survive not only "normal" conditions, but also "worst-case" conditions, without reducing long-term carrying capacity.

Yet at every scale from individual to global, we assume the future will have only better-than-average conditions. We assume that next year a new technology, a pay raise, or a charismatic leader will lift us out of the fiscal and ecological deficits that we have dug ourselves into.

In fact, however, when we do receive a raise or develop better technology, it brings us no closer to sustainability. As U.S. incomes have risen, savings have shrunk, not grown. And despite increases in technology, we grow less sustainable each year.[19] When we improve technology, we use it to consume more, rather than to make ourselves more sustainable by closing the gap between what we produce sustainably and what we consume.

As General Honoré said, we are making our society ever more "brittle" – less able to withstand shocks – as we assume a best-case scenario. We become ever more dependent upon long supply lines, as our food travels a thousand miles or more to reach us, and our water travels 200 miles or more to reach us. Although economic theory (the doctrine of comparative advantage) says that long supply lines are not a problem, this is true only if nothing goes wrong. Long supply lines are fine for optional luxury goods, but they are dangerous for necessities.

At the global level, we destroy our safety margins. Humans consume more and more of the "net primary product" produced by the planet's ecosystem. (Net primary product (NPP) is the total amount of material produced by all photosynthetic organisms.[20]) In 1986, Vitousek et al estimated that humans directly and indirectly consumed 40% of the net primary product produced on land and 25% of the net primary product from land and oceans combined[21]. The number has risen since then.

At the local level, the "brittleness" of our society leaves us even more susceptible than necessary to both man-made and "natural" disasters, such as earthquakes and droughts. For example, after the 1906 earthquake, San Francisco had enough parks and open land to hold tents for all of the families whose houses had been destroyed by the earthquake or subsequent fire. When the next major

[18] http://www.cnn.com/2008/US/weather/06/02/honore.preparedness/index.html
[19] I haven't found an exact definition of Net Primary Product. However, I believe the term is very similar to Primary Product as explained at http://en.wikipedia.org/wiki/Primary_production
[20] Cited by Herman Daly, who was at the time working for the Federal Reserve Board. http://www.fs.fed.us/eco/eco-watch/ew920714
[21] Cited by Herman Daly, who was at the time working for the Federal Reserve Board. http://www.fs.fed.us/eco/eco-watch/ew920714

earthquake occurs, it's hard to imagine that everyone in the S.F. Bay Area will be able to find an open bit of land on which to pitch a tent and dig a latrine, much less find clean drinking water within walking distance. In Mountain View, the attitude is that empty land represents lost profit, not a useful safety margin. One council member told me that population growth is no problem because we have the technology to build high-rise apartments half a mile into the air. I don't think he has figured out where all those people will get clean drinking water and go to the bathroom after an 8.4 earthquake has broken the Hetch Hetchy water system and the sewer system – even if the half-mile high buildings withstand the earthquake.

Recommendation

Just as a prudent family or government or business would keep a "rainy day" savings fund, so a prudent society would keep a large safety margin that it could use in times of emergency. Mountain View is justifiably proud of its disaster preparedness efforts, such as CERT training classes, but should do far more to survive under far-from-best-case scenarios.

- Mountain View should follow EBMUD's example and require large new developments to show that water supplies are adequate to support those new developments, using two criteria:
    - In a 100-year drought, "normal" water needs can be met from our normal sources of supply (Hetch Hetchy, etc.) *with no degradation of the water sources*.
    - Under emergency conditions (e.g. post earthquake AND 100-year drought), survival needs (water for drinking, cooking, sanitation, and firefighting) would be available from sources entirely within the city (mostly groundwater), and groundwater withdrawal rates under these circumstances should not be high enough to cause permanent damage to the aquifer. (Beyond a certain point, groundwater withdrawal leads to ground subsidence and soil compaction that reduces future capacity.) Mountain View should have the capacity to pump the water even after a major earthquake disables conventional power sources.
- Although it is not practical for the city to buy up all the remaining open land, and although we don't even know how much of that we might need in a disaster, the city's land use and population plans should make a reasonable effort to retain enough open space to be able to house a large percentage of the population that has been rendered homeless after a disaster.

This is a long-term task.

Environmental Impact

This recommendation is not directly aimed at CO2/GHG emissions. It is intended to increase broad sustainability. Steps to stabilize or reduce population, and to reduce the "brittleness" of our high-consumption economic system, will also reduce GHG emissions somewhat.

Fiscal Impact

No one knows the exact cost, but it's likely to be quite high. (The cost of doing nothing is, of course, even higher.)

Obstacles

- Given a choice, most consumers and businesses choose to consume more now rather than increase their safety margin.

- Politicians are rarely rewarded by the public for thinking ahead.

Partnerships

The city already has partnerships with disaster preparedness groups, including the Red Cross and ham radio groups, as well as the city's own CERT program. We need to go to the next level and set aside resources (land, access to water, etc.) that we will need after a major disaster.

Furthermore, since the government cannot by itself make all the preparations that are required, all Mountain View residents and businesses must take responsibility for preparing themselves with supplies of water, food, and camping gear, as well as by building robust financial security.

Title: Awareness of peaking resources: 100% use of renewable energies.

Working Group: Sustainable Quality of Life (SQoL)

Statement of Issue

By definition, relying on any non-renewable source is unsustainable. The use of any non renewable source of energy, in particular oil, where supply cannot keep with demand[22], will produce a crisis of unpredictable consequences when the resource begins to be depleted.

Recommendation

Be aware of the impending crisis of peaking oil (short).

Transform the economy of Mountain View to avoid the use of oil (medium-term) and into a 100% renewable energies one (long-term).

Environmental Impact

A way of life that is based on the consumption of non renewable resources cannot be sustained. As soon as the resource is depleted, the society using that resource is forced to change suddenly to either avoid the use of the resource or change into another resource. This sudden change puts the society in risk of social unrest, or even collapse. Recent indicators[23] seem to point that we have already reached that limit for oil consumption. As a consequence, net oil production will be constant in the next few years and begin to decline afterwards. Since the global economy is increasing oil consumption rather than decreasing it, oil prices are expected to continue increasing[24] to force reducing its consume. The dependence on this resource is extremely unsustainable and has unpredictable[25] critical consequences.

Fiscal Impact and Synergies

The fiscal impact of not going into an oil free economy is huge. With predictions of 200$ to 500$ a barrel of oil for the next years, avoiding the use of this resource is extremely important. Switching to a non oil, non fossil fuel way of life is a must.

This recommendation is synergetic with the recommendations of the transportation group.

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[22] The Wall Street Journal: "The conservative IEA appears to be inching ever-closer to the "peak-oil" crowd. Supply simply can't keep pace with demand—everybody with an oil well has the taps open, but there's not much left in the keg" http://blogs.wsj.com/environmentalcapital/2008/07/01/peak-oil-iea-inches-toward-the-pessimists-camp/

[23] Countdown to $200 oil: IEA says current prices justified. http://europe.theoildrum.com/node/4241

[24] IEA warns of tightening oil supplies: http://www.ft.com/cms/s/0/cd683aa0-4764-11dd-93ca-000077b07658.html

[25] "By 2010, the production of the fuel that has driven the world's economy will start to rapidly decline. This will conflict with the steadily increasing demand for oil. The collision of these two trends will lead to shortages and increased prices, providing a strong incentive to shift to alternative fuel resources…Due to unequal distribution through the world of oil and gas supply and consumption, [the upcoming] transition will result in significant shifts in global power and wealth.". http://www.energybulletin.net/node/45679

Obstacles

- The main obstacle is the delusion that there is no such a problem, or that technology will automatically solve the problem, and that oil and other forms of non renewable energy will be always available at affordable prices.
- Implementing this recommendation is not easy, due to the big inertia of people's habits.

Partnerships

San Francisco Bay Oil (http://www.sfbayoil.org)

Recommendation #6

Title: Use the right measuring tools when measuring economic progress.

Working Group: Sustainable Quality of Life.

Statement of Issue

At the national level, our primary measurement of economic health is GNP/GDP. However, GDP (and GNP) have several severe weaknesses.

1) GDP measures economic ACTIVITY, not economic BENEFIT.
2) Although an economic system should maximize satisfaction, ours is deliberately designed to maximize dissatisfaction.
3) GDP isn't even a good measure of economic activity. GDP omits "production" by stay-at-home parents and omits the "services" (such as water pollution cleanup) provided by nature.
4) GDP fails to measure many things that value, including time spent with family, and "spiritual" values.
5) GDP is biased against sustainability. As with a business that consumes its own capital until it goes out of business, we inflate our current GDP by consuming natural capital (fertile soils, groundwater, oil, metals) and thus decreasing future GDP.
6) GDP is very weakly correlated with quality of life.

(For a more detailed list and citations, see the appendix titled "Weaknesses in GDP as a Measure of Economic Progress".)

For all of these reasons, GDP should be used as a very minor economic statistic, yet maximizing GDP growth is our government's primary way of measuring success. This is true at every level of government, from national to local. (At the local level, we define "success" as increased population, increased per-capita income, and increased business profitability, all of which have the same weaknesses as GDP.)

Ultimately, we seek security, happiness, and sustainability. Where material wealth contributes to these things, we should continue to welcome it. But where material wealth undercuts these things, we should not measure it as progress.

Recommendation

If our city chooses to measure its success, that success should be measured using a quality of life measure, not GDP-like measures such as gross income, population, government revenue, or business profits. These are all inaccurate or even inverted proxies for what we really want.

Measuring quality of life is difficult and subjective – but the difficulty in fine-tuning an accurate measuring tool is no reason to choose the wrong measuring tool (GDP). Crude quality of life measures already exist. (See the appendix titled "Quality of Life Measures".)

Specifically, the city should:

1) Stop treating increases in population and income and business and government tax revenue as any evidence of "progress" or "success".
2) Adopt a quality of life measure, such as the Genuine Progress Indicator, as a goal.

3) Explicitly state that our goal is sustainability and that sustainability will not be sacrificed for short-term growth that undercuts long-term sustainability.
4) Consider using and promoting the "Triple Bottom Line", which measures a company's success not only on profit, but also on sustainability and social impact. (Social responsibility can be subjective, so this part of the measurement is still under development.)

See appendix "Sources of Happiness Outside GDP" for further discussion of ways that an economy can improve without necessarily increasing GDP or GHG.

Environmental Impact

For decades, California's population has grown an average of about 2% per year. After the bursting of the dot-com bubble, Mountain View's population growth has been negligible. Assuming that Mountain View's population growth were to return to approximately the state-wide average of 2%, CO2 and other GHG emissions would increase approximately 2% due to population growth alone.

Businesspeople, economists, and politicians generally consider 1-2% annual increases in per-capita GDP quite sluggish, and would like 3-4% growth.

Assuming a 2% per year population increase, a 2-3% per year increase per-capita income, and a need to decrease GHG emissions almost 2% per year to meet target levels, technology would have to reduce GHG emissions by more than 6% per dollar of GDP per year. Technology has yet to achieve this, or even come close.

In fact, technological improvements have hardly reduced GHG emissions at all because as technology has improved, we have applied that technology to consume more, rather than to consume less. (For example, automobile companies have increased engine efficiency 30% over the last 20 years. However, 29/30 of that improvement went into increasing power and only 1/30 into improving fuel efficiency and thus reducing GHG emissions. In other words, radical improvement in technology provided approximately ZERO reduction in GHG emissions.)

Choosing to continue using GDP as our primary economic measure, and continuing the policies that support GDP growth and population growth, would result in an annual increase of 2-4% or more in GHG emissions, something no combination of GHG-reduction recommendations would be likely to compensate for. Choosing to maximize quality of life by choosing to stabilize population, and choosing to stabilize GDP while increasing other quality of life factors, would result in flat GHG emissions. This would give other recommended policies a chance to reduce GHG emissions.

Fiscal Impact

The direct cost of using an alternative measure to GDP (or its local equivalent(s) is unknown) but probably fairly small, assuming that we are willing to accept that all current alternatives are rough approximations.

Obstacles

There is no direct obstacle to government choosing to use a GPI-like indicator to replace or supplement GDP-like indicators. There are potential indirect obstacles:

- Since businesses generally measure their success based on gross revenue and profit, businesspeople are likely to oppose government setting goals based on any criteria that doesn't involve maximizing dissatisfaction to drive increases in consumer purchases.
- Although it is highly likely that the average consumer/resident would welcome government measurements of, and attempts to increase, actual quality of life rather than just income, the consumers/residents might oppose specific measures that reduce government support for income growth if it's not clear that those measures will increase quality of life.
- Furthermore, people don't rate all quality of life factors the same. One person might rate "peace and quiet" as their top priority, while another might rate "loud music" as their top priority. Not only is it difficult to capture both of these in a single measurement, but in some cases (such as this one), the priorities are mutually exclusive (within the same period of time and geographic area).

Partnerships

Redefining Progress (www.rprogress.org/), the organization that developed the Genuine Progress Indicator, is based in the S.F. Bay Area.

ICLEI which has information about the "Triple Bottom Line", as well as about GHG emissions.

The "Mountain View 2030 Vision" team has already asked residents what they value. That work could probably be extended, or repeated at regular intervals (e.g. every 5 years), and perhaps made more rigorous.

Recommendation #7

Title: Flexible labor force

Working Group: Sustainable Quality of Life

Statement of Issue

Many Americans say they would trade some income for more free time in order to spend it with family or leisure activities. Since income is directly related to consumption, this trade off would slightly decrease material consumption while increasing overall quality of life.

Recommendation

- Promote voluntary trade of working hours (and thus, income) for free time. (Short term).
- Legislate or support legislation in favor of free time / income trade. (Medium term)
- Implement such a system for the City Staff.

Environmental Impact

1) Assuming that GHG emission per capita is proportional to purchasing power (which actually may underestimate GHG emission) a voluntary reduction from 40 to 35 hours a week would decrease GHG by 12.5%.
2) For those voluntary reducing to only 4 working days a week, the commuting emissions will reduce by 20% of GHG emission.
3) Even when sustainability is difficult to measure, it seems obvious that less consumption per capita will increase sustainability, since it implies the consumption of less resources, and sustainability is critically dependent on the consumption of non-renewable resources.

Fiscal Impact and Synergies

In principle this recommendation should not require an important cost for being implemented, but in the practice it will need extra reorganization and further complication of HR departments, which fiscal impact seems complicated to measure.

Obstacles

- Even when, in principle, Americans say they would be happy to do this trade of work/income for free time, will they really do it? This recommendation, to be fully effective, needs a change of perspective that more income might not necessarily increase our quality of life (or personal satisfaction) but, counter-intuitively, may decrease it.
- Both the public and private sector might find the benefit of this change small in contrast with the extra organization needed to supply the lack of personal with new one. Note, however, that increased productivity from employees who are happier, less stressed, and who are less tired from long hours may compensate for at least part of the extra “overhead”.

Partnerships

Simple living: http://www.simpleliving.net/main/

Web Sites (not referenced in footnotes)

http://users.ipfw.edu/ruflethe/american.html

Title: Eliminate subsidies supporting population growth.

Working Group: Sustainable Quality of Life.

Statement of Issue

Population is the number one cause of GHG emissions[26]. Consequently, subsidies supporting population growth are, in turn, supporting environmental degradation, and should be eliminated. The government should not "bribe" people to have more children than they can afford or want.

Recommendation

Study which subsidies support population growth and eliminate them. The state should not sponsor big families or alleviate their costs.

Environmental Impact

Studies show that GHG emissions per capita have been constant[27] since the 1970s. This implies that the net emission of GHG is simply proportional to the number of people. Assuming that the elimination of subsidies will decelerate the population growth by 2%, we can expect a total reduction of GHG of 2% per year.

Fiscal Impact and Synergies

This direct impact of this recommendation is to save money since we will be reducing subsidies. The amount saved is unknown but probably fairly small (tens or hundreds of thousands of dollars per year). Indirect savings for things like "affordable housing" subsidies could be much larger, but are difficult to estimate and will depend upon how costs are allocated to city, county, state, and the private sector.

Obstacles

- The general public might interpret this measure as an 'antifamily measure' and oppose to it. In reality, the measure is about letting the people decide how many children they want to have, rather than paying them subsidies to have more.
- Ideally, all such subsidies would be eliminated immediately, and the city would explain to the public why this is being done. As a practical matter, however, changing the rules for families that already have children could cause side effects. For example, although employee family health insurance premiums should be based on the number of children in a family (rather than the typical fee structure, which charges the same whether a family has 1 or 8 children), abruptly increasing fees for families with above-average numbers of children could cause some families to drop health insurance, thus increasing the number of children who are not fully covered by insurance if the family can't afford the higher fee. Thus the city may need to phase out such subsidies over a period of 18 years.

[26] Nature: The population problem. http://www.nature.com/climate/2008/0806/full/climate.2008.44.html
[27] http://www.nature.com/climate/2008/0806/fig_tab/climate.2008.44_F1.html

Recommendation #9

Title: Internalize "external costs".

Working Group: Sustainable Quality of Life (SQoL).

Statement of Issue

An "external cost" is a cost that is not paid for by the consumer or producer of a product. As an example, pollution is an external cost. Economic theory says that external costs lead to inefficient outcomes (from an economic perspective) as well as outcomes that may be undesirable in other ways.

External costs can be addressed in at least 3 ways:

1) "command and control", such as banning or limiting emissions.
2) "pricing", for example taxing a product based on the amount of the external cost.
3) "Internalizing" the external cost – i.e. making the producer or consumer pay the cost. Note that there are 3 options within this:
    a. Producer pays (and typically passes most or all of the cost on to the purchaser/consumer).
    b. Consumer pays. For example, consumers might be required to take hazardous waste to an approved site and pay for proper disposal.
    c. The producer (or consumer) ameliorates the problem. For example, a producer that generates toxic waste products may choose to detoxify the material, recycle the material, use less of the material, or choose a process that generates less waste. In many/most cases it's best for the producer, not the government, to choose which of these is done, because the business has an incentive to choose the most effective solution. (The government still needs to make sure that the producer or consumer does actually internalize the cost and not just dump the problem somewhere else.)

"Internalizing" external costs will increase efficiency and decrease pollution and other environmental problems.

Recommendation

The city should attempt to internalize its own external costs where possible. In some cases, this may mean compensating for damage done; in other cases it may mean halting the activity.

The city should work with other cities, ICLEI, and the state to internalize external costs that the city cannot internalize (or that will simply drive purchases to neighboring jurisdictions, rather than reduce the undesirable external cost).

Environmental Impact

1. The direct impact on the environment is minimal; the impact is all in the indirect effects. In general, internalizing external costs will drive up the costs of "bads" (pollution, etc.) and reduce production of those "bads".

Fiscal Impact and Synergies

- Identifying external costs is relatively easy. However, figuring out the "proper price" for external costs is often extremely difficult. For example, calculating the external cost of a metric ton of CO2 can't be done without knowing what impact that CO2 will have on every ecosystem on the planet, every future technology that will be invented, interest/discount rates from now until humans go extinct, etc. Since the number of external costs is overwhelming (it is likely that the sum of all external costs in the economy is greater than the "GDP" of the entire economy), which means that whether we force external cost emitters to directly internalize those costs or whether we tax them by the amount of the external cost, the amount of work required at a global level is enormous.
- Every dollar spent identifying external costs, the entit(ies) responsible for the external cost, and forcing them to internalize the cost, is a dollar not spent actually solving the problem.
- For cases where the external costs are large (even dwarfing the production cost of the product), internalizing external costs may result in eliminating production of the product because the price (with external costs) may exceed what anyone will pay for the product. Although eliminating this product is the right thing to do (if the costs exceed the benefits of the product), it will cause temporary disruptions as people are laid off and capital is reallocated.
- Internalizing external costs will help with almost every recommendation made by any working group in the task force. Some economists will claim that internalizing all external costs (if it could be done perfectly) would actually completely solve the greenhouse gas problem and any other "pollutant" problem.
- If only a few cities (or states, or countries) try to force businesses and consumers within their borders to internalize external costs, producers and consumers are likely to move production and/or purchases to other jurisdictions, which would merely move, not solve, the problem(s).
- There is an especially high synergy of this recommendation with the recommendation (from the Waste group?) that producers be required to take back products at the end of the product's life.

Obstacles

- As mentioned above, calculating the "proper price" for external costs is often extremely difficult. For example, calculating the external cost of a metric ton of CO2 can't be done without knowing what impact that CO2 will have on every ecosystem on the planet, every future technology that will be invented, interest/discount rates from now until humans go extinct, etc.
- External costs are usually intentional. Businesses, consumers, and others consciously attempt to avoid paying costs and try to dump those costs on others. Obviously, every entity that is trying to avoid the costs of its own side-effects will resist being held accountable/responsible.

Partnerships

The city should work with neighboring cities, regional entities (such as ABAG) and especially with the state to try to force producers and consumers (including government agencies that are themselves producers or consumers of products with external costs) to:

1) Push for "take back" legislation that would require product producers to take back their products at the end of the product's life. Producers would also be required to post bonds so that if the company goes out of business, there is still a fund that will cover most of the cost. (Some companies will deliberately pay managers and stockholders all available cash and then declare bankruptcy to dump the cleanup costs on others.)
2) Push for state-level external costs legislation (and push the state to do the same at the national level).

Appendix: Family PACT Sites in or near Mountain View

Family Pact sites found within 5 miles from Mountain View (sometimes teens prefer to travel to a nearby community for family planning, so they are less likely to be seen and recognized by friends and family) are the following, ranked by distance from zip code 94040:

TEEN & YOUNG ADULT CLINIC (0.0 miles)
(Part of LPCH's Center for Adolescent Health at Castro Commons)
1174 CASTRO ST, SUITE #250
MOUNTAIN VIEW, CA 94040,
(650) 694-0600
http://www.lpch.org/clinicalSpecialtiesServices/ClinicalSpecialties/AdolescentMedicine/teenClinic.html

PLANNED PARENTHOOD (0.0 miles)
225 SAN ANTONIO ROAD
MOUNTAIN VIEW, CA 94040
(650) 948-0807

BARRETT, BENNITT, AND MCNEIL MDS (0.0 miles)
2485 HOSPITAL DRIVE
MOUNTAIN VIEW, CA 94040
(650) 988-7470

MAYVIEW COMMUNITY HEALTH CENTER (1.9 miles)
100 MOFFETT BOULEVARD
MOUNTAIN VIEW, CA 94043
(650) 965-3323

COUNTY OF SANTA CLARA (3.3 miles)
660 SOUTH FAIROAKS AVENUE
SUNNYVALE, CA 94086
(408) 730-8176

PLANNED PARENTHOOD SUNNIVALE (3.3 miles)
604 EAST EVELYN AVENUE
SUNNYVALE, CA 94086
(408) 739-5151

MAYVIEW COMMUNITY HEALTH (3.7 miles)
270 GRANT AVENUE
PALO ALTO, CA 94306
(650) 327-8717

LUCILE PACKARD CHILDRENS HOSPITAL (4.8 miles)
725 WELCH ROAD
PALO ALTO, CA 94304
(650) 497-8000

STANFORD MEDICAL CENTER OBGYN CLINIC (4.8 miles)
900 BLAKE WILBUR DRIVE
PALO ALTO, CA 94304
(650) 725-6079

Appendix: Weaknesses in GDP as a Measure of Economic Progress

At the national level, our primary measurement of economic health is GNP/GDP. However, GDP (and GNP) have several severe weaknesses.

1. GDP measures economic ACTIVITY, not economic BENEFIT. The costs of prisons, environmental cleanup, and kidney dialysis are added to GDP although increasing crime, pollution, and kidney disease will not make our economy healthier.
2. GDP isn't even a good measure of economic activity. GDP omits domestic services of stay-at-home parents.[28] GDP also omits the "services" (such as water pollution cleanup) provided by nature.[29]
3. GDP fails to measure other things that we say we value, including time spent with family, volunteer work, recreation that doesn't require spending money, and "spiritual" values.
4. GDP is biased against sustainability. As with a business that consumes its own capital until it goes out of business, we inflate our current GDP by consuming natural capital (fertile soils, groundwater, oil, metals) and thus decreasing future GDP.
5. GDP is rarely corrected for population growth. For example, a recession is defined as 2 successive quarters of declining GDP. However, if population grows 1.0% and the GDP grows 0.5%, then people are worse off (in financial terms), but the economy looks as though it is growing. Conversely, if the population shrank 0.5% and the GDP shrank 0.25%, we would officially be in a recession, despite the fact that incomes would be rising.
6. GDP is very weakly correlated with quality of life. Surveys indicate that quality of life has declined over the last 50 years, even though inflation-adjusted per-capita incomes have nearly tripled.[30]
7. In part because we measure economic progress by measuring GDP, our economic measurements and goals are outright perverse. In theory, the purpose of any economic system is to maximize satisfaction. But the purpose of our economic system is to maximize DISsatisfaction. As far back as 1929, General Motors executive Charles Kettering stated that although customers should be sold products on the grounds that those products would bring them greater satisfaction, those same customers needed to be made

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[28] For example, if my wife (or I) stay home and take care of our child, that adds nothing to GDP. But if we pay a neighbor $1000 per hour to take care of our child while the neighbor pays us $1000 per hour to take care of their child, then GDP skyrockets – yet the total amount of child care produced is the same in both cases. Some studies of the economic production of stay-at-home parents estimate approximately $100,000 a year of value for child-raising, cooking, nursing during illness, etc. In an economy where the median wage is about $30,000 per year, measuring $30,000 of income from one parent while ignoring $100,000 of unpaid production by another parent means that the size of the error in measurement is more than three times greater than the value measured.

[29] "Overall, the annual value of the world's ecosystem services is estimated at $33 trillion, or greater than the gross national product of all nations combined [in the year the calculation was done]." http://www.sciencedaily.com/releases/2007/12/071205131149.htm In other words, roughly half the economy was ignored by this one measurement error alone. And, of course, the real value of some of these services is effectively infinite, since we would go extinct without them.

[30] Although our material standard of living has tripled over the last 50 years, "the number of Americans who say they are very happy peaked in 1956 and has gone steadily downhill ever since", says Bill McKibben, author of "Deep Economy: The Wealth of Communities and the Durable Future". McKibben says our economic policies are a double failure, increasing environmental damage while decreasing satisfaction. The U.S. is "near the bottom of the developed world, and behind a surprising number of developing countries, in levels of happiness". McKibben points out that if happiness is not closely linked to material consumption, then re-designing our economy can simultaneously increase happiness and decrease environmental damage. In Europe, happiness and leisure time are higher; yet energy usage is 50% lower. See also http://www.csmonitor.com/2007/0529/p17s01-bogn.html?page=2

dissatisfied after the purchase so that they would want to buy a newer product.[31] This is a recipe for both unhappiness and unsustainability, since we can consume everything that can possibly be consumed, and yet still be left unhappy.

If we're spending more and consuming more but we're not happier, then the system is broken, even if you're a materialist.

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[31] Charles Kettering: General Director of Research Laboratories at General Motors wrote an article titled "Keep the Consumer Dissatisfied" The article was originally published in Nation's Business, 17, no. 1 (January 1929), 30-31, 79.

My citation is from the internet:
http://websupport1.citytech.cuny.edu/Faculty/pcatapano/lectures_us2/consumerdis2.html

Appendix: Quality-of-Life Measures

Although no quality of life measure is perfect, there are some that we can use, including:

GPI (Genuine Progress Indicator): this measure, developed by a group called "Redefining Progress", takes into account some quality of life factors and that also subtracts, rather than adds, money spent on things like prisons, health care costs due to obesity and smoking, etc. [32]

Bill McKibben's work relies on self-reported happiness indicators.

Ronald Inglehart, of the University of Michigan, has compared happiness levels across countries. According to Inglehart, peace and freedom of choice are the biggest factors in people's happiness. [33]

Other researchers have found that most people's level of happiness is determined not by their absolute wealth, but by their perception of their wealth relative to others. This suggests that in societies that have an uneven distribution of income, and in which most people are relatively poor, and in which people are aware of their relative income, have a relatively low rate of happiness. Interestingly, Puerto Ricans rate themselves as happier than Americans, despite the fact that their average income level is considerably lower.

The country of Bhutan has explicitly set its goal as maximizing Gross National Happiness, not gross economic output. Bhutan's four pillars of Gross National Happiness are sustainable socioeconomic development, environmental protection, cultural preservation, and good governance. According to one source, self-reported happiness among the people of Bhutan is quite high. [34] The country has suffered from ethnic tensions, however, and one source reports that 100,000 ethic Nepalese were expelled from Bhutan and into refugee camps in Nepal. Those 100,000 might not self report an equally high source of happiness.

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[32] http://www.rprogress.org/sustainability_indicators/about_sustainability_indicators.htm
[33] http://www.cnn.com/2008/HEALTH/07/02/nations.happiness/index.html?iref=mpstoryview
[34] http://ngm.nationalgeographic.com/geopedia/The_Democratic_Experiment_of_Bhutan

Appendix: Sources of Happiness Outside GDP

Although economists claim that everything can be measured by money (by measuring how much money people will pay to get something they want, such as lower pollution levels, or how much money people will demand to be paid to tolerate something they don't want), most non-economists don't seem to believe that everything can be measured with money.

Please note that we are NOT saying that government should choose some or all of these as goals. The community, not government bureaucrats, should choose which of these are important. And to the extent that any of these have no external costs, individuals should choose their own factors. Our point is simply to list some factors that contribute to quality of life but that are difficult or impossible to measure by measuring GDP and that can be increased without substantially increasing consumption of non-renewable resources or emitting pollutants such as greenhouse gases.

1) A more close-knit community.
2) Time with family.
3) Time with friends.
4) Time alone.
5) "Peace and quiet".
6) "Less stress".
7) Sleep. (Studies show that Americans are seriously sleep-deprived, and this decreases job productivity, increases stress, shortens lifespan, and reduces quality of life.)
8) Freedom from telemarketers, "spammers", junk mail, door-to-door solicitors, etc.
9) "Spiritual Values".
10) Artistic pursuits that require very little money or resources, such as music, painting, dance etc. (Of course, if you want to buy a Stradivarius, or want to dump cadmium-based paints into the sewer, or want to build a dance hall those don't necessarily qualify as low-cost and as harmless to the environment. But some arts require very little money.)
11) Education in many topics, such as languages.

The following require money to buy land, but once the land has been purchased (which of course is not cheap in Mountain View), the activities themselves require almost no money from the user. As population grows, which drives up the price of land, opportunity for these activities decreases, *no matter how much per-capita income grows*.

1) Some types of recreation that don't require much money, for example walking, jogging, and bicycling.
2) Gardening.

Again, the point is not that government bureaucrats (or environmental task force members) should arbitrarily pick "winners and losers" from among these. The point is simply that these are ways to increase quality of life without increasing consumption of non-renewable resources or increasing greenhouse gas emissions.

Appendix: Sustainability Expert on EPC

We cannot calculate the real cost/benefit ratio of having a sustainability expert on the EPC because the costs and benefits depend upon the decisions made by the EPC with this expert (and upon how different those decisions are from what they would have been without the sustainability expert). In this appendix we list a few of the types of ideas that a sustainability expert might suggest and describe the possible savings from those ideas.

1) Reduced needs of and costs of motor vehicular parking for the businesses in Mountain View. This would directly reduce city capital costs for acquiring land and constructing roads and parking lots on the land, and would also save the city money on the cost of maintaining the roads and parking lots. To the extent that businesses would spend less on parking (both on what they construct at their own expense, and on what they pay tax money to the city to construct), the savings could allow for greater competitiveness in a greater variety of goods and services at attractive costs.
2) Access to schools and other services can be designed in to be made easier for walking and bicycling options.
3) Solar and wind energy, depending upon the particular situation, can be allowed for and required.
4) Clean commercial enterprises could be encouraged more.
5) Increased use of sustainable building materials (employing LEED requirements for one).
6) Reduced costs in cleanup from the settling of pollutants from the air.
7) Reduced cost in health care on the account of more healthy physical activity and reduced lung diseases.

Thus the appointment of a person onto the EPC that is strong on sustainability along with staff support could have its costs recovered by the decisions that the EPC makes.

Appendix: Fundamental Guidelines

Some ideas do not fit into specific recommendations, but are too important to lose, so we have put them together in this appendix.

1) **We are currently unsustainable.** We cannot keep doing what we're doing now.
2) **We are becoming less sustainable**, not more sustainable. This is true despite the fact that technology is improving. The high-tech countries are growing further from sustainability just as fast as the low-tech countries are.
3) A society is either sustainable or it isn't. If it's not sustainable, then by definition it collapses. Since we are unsustainable and growing further from sustainability, **if we do not make radical changes, then we will never become sustainable**.
4) **The cost of failure is effectively infinite.**
5) Although cost/benefit calculations are very valuable when they can be done, they often can't be done because not enough information is available. Since the cost of failure is infinite, and since failure is certain unless we make major changes, we cannot use lack of cost/benefit information as a reason to refuse to make changes. (We still WANT cost/benefit ratios so that we know which things to tackle first, and in some cases which things are worth doing at all. But absence of cost/benefit ratio is not a justification for inaction / "laissez-faire".)
6) "The real bank is resources, not money." Money is an accounting system, not a store of value. Our "natural capital" is depreciating rapidly, and our accounting system masks that rather than highlighting it.
7) **Technology and economics do not change the laws of physics**. (Every economist needs to know the laws of thermodynamics.)
8) **We need to "front-load" changes.**
   Most proposals for change "back-load" the changes. For example, Democrat John Edwards and Republican Arnold Schwarzenegger have set a goal of 80% reduction in CO2 emissions – by the year 2050, long after they will have left office. However, we need to "front-load" the changes. Logically, we should start making changes that are easiest or have the most favorable cost/benefit ratio. This means that the work will get harder as time goes on. If, for example, we plan to make 50% of the changes in the next 20 years, and the remaining 50% of changes in the 20 years after that, we would give the illusion of splitting the work evenly, but actually the second half would be far more difficult than the first half. (This is true even if you take technological improvement into account.)
9) "Smart growth" makes as much sense as "smart obesity" or "smart cancer". (Although in the short run "smart growth" is better than "dumb growth", the laws of physics set an upper limit on growth. Infinite growth is impossible, whether it's "smart growth" or not.)
10) "The environment is not an optional luxury sector in the economy; the economy is an optional luxury sector in the environment."